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Hiro Ikegaya

AIR POLLUTION BY OPEN ELECTRIC FERRO-ALLOY FURNACE (REPORT NO. 4)

[Gokintetsu Yo Kaiho Kei Denkiro no Taiki Osen ni Tsuite (Dai 4 Ho)]

Proceedings of the 13th Symposium of the Japan Air Pollution Society, p. 150.

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Hiro Ikegaya*

AIR POLLUTION BY OPEN ELECTRIC FERRO-ALLOY FURNACE (REPORT NO. 4)

I have reported in the past three times on air pollution caused by smoke emitted from open electric ferro-alloy furnaces and on countermeasures against the generation source. The first report covered the quantities of gas and the properties of the dust generated by F-Si, F-Mn, F-SiMn from open electric furnaces and measures to prevent its generation. The second report covered a comparison of the proportions of air flow to the theoretical quantities of gas generated, the configuration of the furnance hood and a large number of temperature variations with various melts. The third report discussed actual examples covering F-Mn and F-SiMn when the exhaust gases generated by a number of furnaces were passed through a number of dust collectors.

In Report No. 4, a comparison is made when pre-treatment equipment (sintering equipment) was used and was not used in the melting of F-Cr; the [Tr. Note: illegible, possibly smoke] suction effect in a [Tr. Note: illegible] Segel-Bader [Tr. Note: phonetic in the original] type open electric furnace and the associated dust collectors; the composition and grain distribution of F-Cr dust; the air flow ratios and changes in temperature vs the theoretical quantities of gas and dust generated. The results are shown in the tables and illustrations.

Relative to the effects of dust properties on the dust collectors used with generation sources and countermeasures, the particles that are generated from F-Cr electric furnaces are extremely abrasive. It is necessary that

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* The Chiyoda Kohan Company Limited.

adequate measures be taken in centrifugal type predusters or in chute flow conveyor belts.

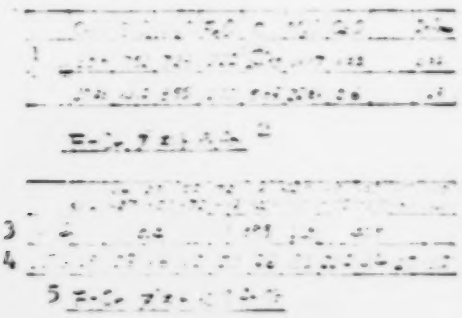
In addition, a comparison was made of the following cases when F-Cr dust collectors are used:

Electric furnace - directly connected co er - bag filter - blower - air exhaust pipe type and,

Electric furnace - preduster - blower - bag filter.

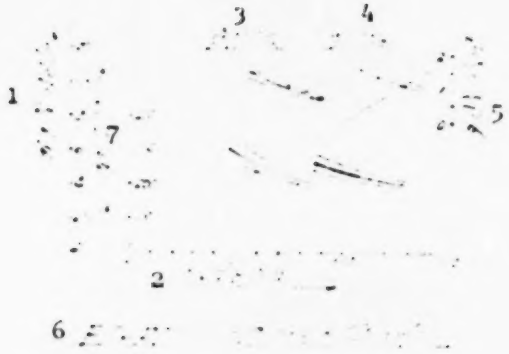
As a reason for selecting the type, serious consideration was given to furnace operating conditions of the past, particularly the blowing state.

Relative to a F-Cr [illegible] Segel-Nader type open electric furnace, suction (exhaust gas) from the generation source is difficult and the fed air ratio is high. A discussion is presented relative to this point on the type of furnace hood, operating methods, etc.



Key:

1 - raw ore; 2 - F-Cr dust composition; 3 - sintered ore; 4 - raw ore; 5 - F-Cr dust grain distribution.



Key:

1 - quantity of gas Nm^3/hr; 2 - input air ratio; 3 - sintered ore; 4 - raw ore; 5 - quantity of dust g/Nm^3; 6 - quantity of gas, gas temperature and quantity of dust in F-Cr open electric furnace; 7 - gas temperature °C.

Key:

1 - quantity of gas Nm^3/hr; 2 - gas temperature °C; 3 - quantity of dust g/Nm^3; 4 - air input ratio; 5 - quantity of gas, gas temperature and quantity of dust in a F-Cr type electric furnace.

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December 14, 1975

Mrs. Libby Smith
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Dear Mrs. Smith:

We received your request on the translation of our journal, the "Taiki Osen Kenkyu". We are glad to express our permission of the translation without any limitation.

Sincerely yours,

Toshiichi Okita

Toshiichi Okita Dr. Sc.
Chief, Department of Community Environmental Sciences

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